Base Year: 1999 By: T. Dinh

SOURCE INVENTORY

CATEGORIES # 357 - 359

COMMERCIAL BOATS

1999 EMISSIONS

Introduction

Emissions reported in these categories are from the combustion of fuel from engines of commercial boats in the San Francisco Bay Area. Commercial boats are made up of ferries and fishing boats that navigate within the boundaries of Bay Area waters.

Methodologies

Ferries' emissions taken into account are from the combustion of engines of large commercial passenger ferries. These ferries are used in the transport of passengers across a water channel. Fishing boat emissions are derived from emissions given off from the combustion of commercial fishing boat engines. For fishing boats, emissions from both diesel and gasoline engines were taken into account.

In 1999, five ferry operators performed the bulk of ferry services within the Bay Area waters. The ferry operators include (1) The Blue and Gold Ferry Fleet, (2) the Golden Gate Ferry Transit Division, (3) the Baylink Ferry Transit, (4) the Red and White Ferry Fleet, and (5) the Alameda Ferry.

Information used to calculate ferry emissions was gathered from various sources. Ferry traffic and operating times were obtained from ferry schedules as provided by ferry operators. Ferry loading capacity, engine size/rating, and diesel usage were either provided by the ferry operators and/or estimated based on available studies and references. Emission factors used were based on a 1991 report written by Booze, Allen, and Hamilton titled, "Inventory of Air Pollutant Emissions from Marine Vessels".

Fishing boats' emissions were derived from a 1980 KVB report titled, "Inventory of Emissions from Boating Sources in California – Final Report - July 1980". In this report, annual fuel sales data of commercial fishing boats along the California coast were tabulated and spatially distributed along geographical boundaries. The geographical boundaries shown in the report include Eureka, San Francisco Bay Area, Monterey, Santa Barbara, Los Angeles and San Diego.

Average emission factors used in the emission calculations for commercial fishing boats were obtained from AP-42, Table II-3-1.

Monthly and Weekly Variation

For commercial ferry boats, monthly activity was assumed to be 55% during the months of April to September, and 45% for the remaining months. Weekly activity was assumed to be 60% during weekdays and 40% during weekends.

For commercial fishing boats, monthly activity was assumed to be uniform, and weekly activity was assumed to be 60% on the weekdays and 40% on the weekends.

County Distribution

For ferries, county fractions were not based on actual port location, but rather on where the emissions activity occurred during a particular mode of operation. For example, during an in-transit mode, ferries may pass through several counties on their way to and from dock stations.

For fishing boats, county distribution was based on fish block maps provided by the California department of Fish and Game. These maps divide each geographical area into squares, which indicate the annual quantities of fish caught per square.

TRENDS

Growth profile for ferry boats was assumed to be the same as that for public services developed by ARB. A 5% per year increase in diesel fuel usage was assumed for fishing boats, and a 1% increase per year for commercial gasoline usage.

Control

Projected emissions include expected benefits from ARB's Clean Diesel Fuel Regulations (Beginning 1993) and Re-Formulated Gasoline Phase II (beginning 1996). These benefits were estimated using control factors developed by ARB. Additionally, federal EPA marine requirements finalized in 1999 on new commercial marine diesel engines will help reduce NOx and PM emissions. These requirements will affect marine vessels with new model engines beginning in 2004.